NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD

BRUSH MANAGEMENT

(acre)
CODE 314

DEFINITION

Removal, reduction, or manipulation of non-herbaceous plants.

PURPOSES

This practice may be applied as part of a conservation management system to accomplish one or more of the following purposes:

* Restore natural plant community.
* Create the desired plant community. ie Plant community desired for domestic animals and/or wildlife species of concern.
* Reduce competition for space, moisture, and sunlight between desired and unwanted plants.
* Manage noxious woody plants.
* Restore desired vegetative cover to protect soils, control erosion, reduce sediment, improve water quality and enhance stream flow.
* Maintain or enhance wildlife habitat including that associated with species of concern.
* Improve forage accessibility, quality and quantity for livestock.
* Protect life and property from wildfire hazards.
* Improve visibility and access for handling livestock.

CONDITIONS WHERE PRACTICE APPLIES

On rangeland, native or naturalized pasture, pasture and hay lands where removal or reduction of excessive woody (non-herbaceous) plants is desired.

1 On brush-infested land having the potential to produce desirable native or adapted forage plants;

2 where adjustments in grazing management alone will not restore the kind of plant cover needed to attain conservation objectives within a reasonable time;

3 where brush management will improve areas for wildlife, recreation, or natural beauty;

4 where control of woody phreatophytes is necessary to conserve moisture; or

5 where a reduction of brush is necessary to the safety of life and property in area of high wildfire hazard.

CRITERIA

General Criteria Applicable To All Purposes Named Above

Brush management will be designed to achieve the desired plant community in woody plant density, canopy cover, or height.

Brush Management will be applied in a manner to achieve management of target woody species and protection of desired species. Mechanical, chemical, biological, prescribed burning or a combination of these methods will accomplish this.

GENERAL CRITERIA continued

Prescribed Grazing (528) and/or Use Exclusion (472) shall be applied to ensure desired response from treatments. See Practice Standards & Specifications 528 and/or 472 for grazing management requirements after Brush Management

Reseeding of native species will be necessary where less than 25% similarity index to the ESD plant community is present or where less than 10% basal cover of desired species remnants are present pre-treatment. Use practices Range Seeding (550) where no significant soil disturbance or landscape shaping is present. Use Critical Area Planting (342) where significant soil disturbance or landscape shaping is present.

The method of brush management with the least potential hazard to man, animals, and the environment, will be used meeting the conservation needs and objective of the operator. The need for brush management is governed by the land-use objectives, alternatives in management, the kind and amount of infestation by brush species, as well as considerations of the anticipated impacts upon the environment, cultural resources, and landscape.

Brush management **will be applied** only to sites:

1 With soils having potential for producing the desired plant community

2 When brush invasion/infestation exceeds the threshold for the historic climax plant community for the site. (Refer to the ecological site description (ESD).)

3 Which will receive grazing management and other maintenance measures that ensure success.

4 When non-brush pastures of the operating unit are already under grazing management that assures an improving trend.

5 Brush management will be planned in a manner that it will not adversely affect threatened or endangered species, their habitats and/or critical habitats

Brush management **will not be applied** to sites:

1 Where removal will result in sustained accelerated erosion.

2 Where the benefits are not commensurate with the costs and the objectives of the landowner.

3 Where removal will be adverse to the long-term productivity or optional uses of the land. See woodland Technical Note No. 1 (revised April 2, 1981. RE: Pinyon-Juniper Management.)

4 Where grazing management is inadequate on non-brush areas of the operating unit.

5 When there will be long term negative impact to environmental, cultural or landscape resources.

Treatment will be designed prior to implementing the practice and will meet the recorded land-use objectives including environmental, cultural and landscape considerations:

1 When objectives include recreation area improvement. Refer to specifications for practice 562 - Recreation Area Improvement.

2 In areas of mixed stands of brush for which approved methods have been established, priority of treatment will be that prescribed for the species that is causing the greatest problem. Methods should be selected to reduce the greatest number of undesirable brush species with least harm to the desirable brush species.

CRITERIA continued

3 It may be desirable to plan more than one control method for the same species or a control for two or more species under certain conditions.

4 Refer to Practice 645 - Wildlife Upland Habitat Management for pertinent wildlife planning considerations.

The computation technique used will be documented to substantiate the degree of infestation (Table 1) for the brush to be manipulated. The following techniques will be used.

To determine canopy cover of shrub species use; New Mexico Range Technical Note No. 28 (Rev. September 1970), describes a method to determine canopy cover using the line intercept method. Please use this method where line intercept is listed as the inventory method in table 1.
http://www.nm.nrcs.usda.gov/technical/tech-notes/range/range28.pdf

To determine plants per acre of shrub species: The 1/10 acre plot (6.05' x 720' and/or 66' x 66') representative of the brush infestation is acceptable for the plant count when three plots or more are taken and the average is used. See page 93 of the Sampling Vegetation Attributes." Interagency Manual for complete instructions.
http://www.cnr.colostate.edu/class_info/rs332/SamplingVegAttributes.pdf

To determine canopy cover of tree species The National Forestry Handbook, Western Region, May 1979, describes the use of the zig zag transect for plant count. This method is only to be used on Juniper or mixed pinion/juniper/ or mixed p/j/ponderosa stands. ftp://ftp-fc.sc.egov.usda.gov/NSSC/National_Forestry_Handbook/nfh_2004.pdf

The average tree spacing is found by dividing the total of distances in the zigzag transect by the number of trees sampled.
The number of trees per acre = 43560/Avg. tree spacing squared. Only enough data needs to be gathered in the zigzag transect to yield the average tree spacing.

Additional Criteria for Chemical Pesticide Use:

The cooperator will be advised on:

1 Safe handling and disposal of herbicides to avoid injury to humans, domestic animals, desirable plants and fish, or other wildlife, and any contamination of nearby crops.

2 Federal, state and county laws and regulations governing the use of herbicides and labeling. The uses for which a herbicide has been registered are included in the information provided on the label of the commercial product. By reading the label, determine the proper uses for which the product is intended. Herbicides approved for specified uses in New Mexico are listed in the New Mexico Extension Service publication, 400-B-17, "Chemical Weed Control Guide." Refer to the label on the commercial product for detailed information concerning dosage application and precautions. Certain precautions may be noted in the publication that are not included on the label but are applicable to local conditions in New Mexico.

3 It is legal to use registered mixtures of herbicides; however, only a few mixtures of herbicides are registered.

4 Proper certification to apply the herbicide.

5 Note that label data on herbicides are maximal values and also represents manufacturers guaranteed product efficacy rates. Lower marginal rates must be approved by the ASTC/Technical Services.

6 Environmental Risk Analysis (WIN-PEST) and interpretation of analysis and identification of appropriate mitigation techniques must be integrated into the conservation plan and discussed with the operator.

Additional Criteria for Prescribed Burning:

Fire is a natural part of several ecosystems and prescribed burning can be used effectively to

reduce or remove species such as sagebrush or juniper. When prescribed burning is used on root-sprouting brush species such as oak, maple, rabbitbrush, yellowbrush, horsebrush, or willows, follow-up with other methods will be

CRITERIA continued

necessary for effective control. Proper herbicide application is an effective follow-up method.

Burning can be used without seeding where desirable fire tolerant plants make up 15 percent or more of the total composition. When seeding is needed, burning is a good pretreatment to prepare the area for seeding.

If this method is used, the standards and specifications for Prescribed Burning (338) will apply.

Additional Criteria Relating to Degree of Reduction (Percent Kill):

The degree of reduction will depend upon the method of treatment selected, the objectives of the cooperator, and the environmental consequences. The Ecological Site Description (ESD) can be used to set a target level of brush reduction.

A general guideline is to expect 80%or more of the target species to be killed or destroyed within the treatment area at the conclusion of all treatments. In some cases other resource considerations (such as wildlife habitat needs or socio-economic concerns) may dictate a lesser percentage of density reduction. All such decisions must be recorded in the Brush Management job sheet.

The percent of target species reduction can be calculated by conducting a series of transects in the pre treatment state and comparing that to the post treatment numbers in the same transect lines. See table 1 in the Specification of the proper transect method for each target species.

Additional Criteria for Improving Wildlife Habitat.

Brush Management will be planned and applied in a manner to meet the habitat requirements of the wildlife species of concern.

Additional Criteria for Reducing Wildfire Hazards.

A variety of management activities can be used to control undesirable woody plants and reduce wildfire hazards at the same time.

See the Firebreak (394) practice standard and specification for criteria and considerations that will aid in designing a management strategy to reducing wildfire hazards.

CONSIDERATIONS

It is the policy of the Natural Resources Conservation Service (NRCS) to encourage the use of pest-control methods having the least potential hazard or adverse impact on man, animals, and the environment.

NRCS conservationists have the responsibility to document plans in sufficient detail to predict the effects of the proposed brush management upon the environment, cultural resources, and landscape.

Conservationists are to:

1 encourage cooperators to fully consider present and future land use opportunities in relation to brush management, including expected effect on wildlife habitat, potential recreation use, and ecological site;

2 determine that the landowner understands the technical requirements, possible hazards, and costs of the practice and that the landowner will apply the kind of grazing management and maintenance measures that will insure success; and;

3 help land users understand the environmental impacts of brush management, both positive and negative, on-site and off-site.

While the final decisions to proceed on any practice or management system rests with the landuser or landowner, the conservationist must provide complete, factual information in order to assist the decision maker to:

Considerations continued

1 Understand the extent and value of all of the resources which would be impacted.

2 Evaluate both the short-term and long-term, on-site and off-site, impacts of proposed actions.

3 Select the alternative, which has the greatest positive impacts on social, economic, and environmental resources.

4 Recognize the opportunity to select an alternative with high potential for improving multiple resources.

5 Recognize the difficulty of vegetation establishment when choosing a method of control that causes soil disturbance.

6 Recognize that the timing and sequence of brush management in a pasture and/or the entire operating unit should be planned to ensure needed grazing management.

In order to accomplish these planning considerations, the conservationist should prepare evaluations of the potential impacts of the selected action or alternative upon:

1 Current and potential future forage production.

2 Current and potential future wood products.

3 Current and potential levels of erosion and water quality.

4 Current and potential future values of wildlife habitats and wildlife populations.

5 Current and potential future recreational uses.

6 Current and potential future impacts on the landscape; expressed as the visual impact and sensitivity level of the landscape as a function of the viewing public.

7 The kinds and amounts of grazing management and maintenance measures which will be needed to ensure the success of vegetative changes. The possible costs, marginal dollar reaction, and economic hazards will be evaluated. These evaluations will be thoroughly discussed with the decision maker.

Infestation is based on the percent of crown canopy of the dominant and associated species, or on the number of plants per acre. See Table l for a definition of the degree of infestation for certain species.

A heavy infestation indicates that brush is thick enough to suppress a quality plant cover and hinder movement of some classes of livestock.

A medium infestation indicates that brush is significantly limiting quality plant cover.

A light infestation indicates brush presence is recognizable but not in sufficient quantity to appreciably limit quality plant cover.

For some land uses, brush may be desirable. For others, it may be desirable to reduce some species to prevent later infestations that may require more costly measures.

PLANS AND SPECIFICATIONS

Plans and specifications will be prepared for each pasture, field, or management unit where Brush Management will be applied.

Plans and specifications will be based on the practice standard and may include narratives, maps, drawings, job sheets, or similar documents. These documents will contain the following data as a minimum.

1 A location or sketch map with soils information showing areas to be treated and areas to be left undisturbed.

2 Species to be treated.

3 Pretreatment infestation, method of determining infestation and treatment method.

4 Follow up measures, if needed.

PLANS AND SPECIFICATIONS Continued:

5 The cooperator objectives of the control measures and the acceptable degree of reduction agreed upon to meet the objectives.

6 Any mitigation planned for environmental, cultural, or landscape resources.

7 Prescription for deferment and or prescribed grazing.

8 Check-out procedure and certification of completion.

For mechanical treatment methods, plans and specifications will include types of equipment and any modifications necessary to enable the equipment to adequately complete the job. Also included should be:

* Dates of treatment

* Operating instructions

* Techniques or procedures to be followed

For chemical treatment methods, plans and specifications will include:

- Practice standards and specifications for Brush Management (314) and Pest Management (595) and Use Exclusion (472) must be planned and met.

- Plan Map with locations of sensitive resources and setbacks (buffer areas).

- Environmental Risk Analysis (WIN-PEST) and interpretation of analysis and identification of appropriate mitigation techniques.

- Operation and maintenance requirements.

- Herbicide name

- Rate of application or spray volumes

- Acceptable dates of application

- Mixing instructions (if applicable)

- Any special application techniques, timing considerations, or other factors that must be considered to ensure the safest, most effective application of the herbicide

- Reference to label instructions

For biological treatment methods, plans and specifications will include:

- Kind of biological agent or grazing animal to be used

- Timing, duration, and intensity of grazing or browsing

- Desired degree of grazing or browsing use for effective control of target species

- Maximum allowable degree of use on desirable non-target species

- Special precautions or requirements when using insects or plants as control agents

- See Prescribed Grazing (528) Specification titled: “Supplement 1 – Brush and Weed Pest Management With Goats” for details on Brush Management using Goats.

OPERATION AND MAINTENANCE

Operation: Brush Management practices shall be applied using approved materials and procedures. Operations will comply with all local, state, and federal laws and ordinances.

Success of the practice shall be documented in a written report, technical notes, job sheet, etc. by evaluating regrowth or reoccurrence of target species after sufficient time has passed to monitor the situation and gather reliable data. Evaluation periods will depend on the methods and materials used.

Maintenance: Following initial application, some regrowth, resprouting, or reoccurrence of brush in excess of original goals and objectives should be expected. Spot treatment of individual plants or areas needing retreatment must be done as needed.

Where it is not otherwise specified, the treatment and the time interval between treatments will be determined by the conservationist and the decision maker.

Areas where brush has been manipulated must be managed in a way that is compatible with the treatment and land-use objectives.

The NRCS conservationist will present alternatives for the protection period needed to provide the greatest benefit to the species to be increased.

1. Grazing management will meet prescribed grazing standards and specifications (528)

2. Drought following treatment, low vigor of desirable grasses, invasion of the treated area by undesirable plants and other abnormal conditions may require extension of the protection period beyond the minimum required under the above conditions. The NRCS conservationist will be expected to encourage the cooperator to extend the protection periods whenever the above conditions exist.

3. The degree to which the key forage species will be used following protection/ deferment will be in accordance with specifications for prescribed grazing.

4. Areas of significant size disturbed by mechanical brush treatment will be reseeded unless it is determined that natural revegetation by desirable species will occur within a reasonable period, normally two or three years. In the Southern Desert Land Resource Area, seeding may be feasible only on selected sites, usually having over 13 inches of precipitation. Site selection will be made by the cooperator with the assistance of the NRCS conservationist.

5. When seeding is necessary, prescribe specifications for seeding practices at the time brush management is planned. It is recommended that native species be used when appropriate. It is recommended that species composition and content be as close a match as possible to the Eco-System description (ESD) for the area.

6. Follow-up treatment treatment may be necessary.

REFERENCES:

Range Technical Notes -- #17 through 22, 32, 35, and 45 (Interagency Reports 1, 2, 3, and 4)

Chemical Weed Control Guide, NMSU, Agri. Exp. Sta. Bulletin 400-B17-Current Issue -

Methods of Controlling Pricklypear Cactus, NMSU, Agri Exp. Sta. Guide B-800

Control Cholla Cactus, NMSU, Agri Exp. Sta. Guide B-804

Brush and Weed Control on New Mexico Ranges, NMSU, Agri Exp. Sta. Guide B-806

Control Perennial Snakeweed, NMSU, Agri Exp. Sta. Guide B-815

Snakeweed Control With Herbicides, NMSU, Agri Exp. Sta. Bulletin BL-706

Vegetation Change Following Big Sagebrush Control With Tebuthiuron, NMSU, Agri Exp. Sta. Bulletin BL-764

Juniper Control with Soil-Applied Herbicides, NMSU, Agri Exp. Sta. Bulletin BL-772

Management of Mesquite, Creosotebush, and Tarbush with Herbicides in the Northern Chihuahuan Desert, NMSU, Agri Exp. Sta. Bulletin BL-775.

Mesquite Control in New Mexico, NMSU, Agri Exp. Sta. Circular-CR-505.

Considerations for Prescribed Burning, NMSU, Agri Exp. Circular-CR-522.

1994 Summary of Range Brush Control Research, NMSU, Agri Exp. Sta. RITF-RITF-38.

Snakeweed: Problems and Perspectives, NMSU, Agri Exp. Sta. Bulletin-BL-751.

Current issues of NMSU, Agri Exp. Sta. Bulletins, Circulars and Guides are available in all County Agricultural Agent Offices.

Guidelines for Prescribed Fire In New Mexico, New Mexico State Forestry, January 1992.

John P. Taylor and Kirk C. McDaniel, 1998, Restoration of Saltcedar (Tamarix sp.)-Infested Floodplains on the Bosque del Apache National Wildlife Refuge, Weed Technology 12:345-352.

Keith W. Duncan & Kirk C. McDaniel, 1998, Saltcedar (Tamarix spp) Management with Imazapyr, Weed Technology, 12:337-344.

Assessment & Conservation Strategy for the Lesser Prairie-chicken, Lesser Prairie-chicken Interstate Working Group, February 12, 1999